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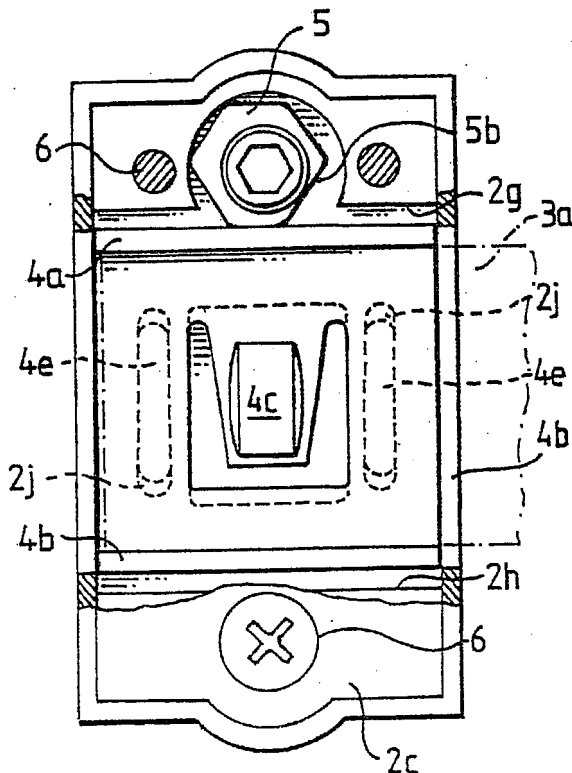
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(54) Title: A HINGE CUP FOR A HINGE BLADE



(57) Abstract: A hinge cup (2) for receiving the pivotal hinge blade (3a) of a hinge (1) accommodates a slide (4) that has a snap-in element (4c) for coaction with a corresponding opening (3) in the hinge blade. The hinge cup and the hinge blade can be adjusted vertically by virtue of the slide including rear vertical side guides (4e) on each side of the snap-in element, and by virtue of the hinge cup having an eccentric nut-like height adjustment element (5) non-rotatably mounted on a horizontal shaft. The element (5) includes a number of adjustment surfaces (5b) corresponding to different height adjustment positions for the slide (4) and the hinge blade (3a). A further development of the invention includes a non-rotatable element opposite the height adjustment element, for horizontal adjustment of the slide and hinge blade.



*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## A HINGE CUP FOR A HINGE BLADE

### FIELD OF INVENTION

5 The present invention relates to a hinge cup for receiving a hinge blade, and more specifically to a hinge cup of the kind defined in the preamble of Claim 1.

Hinge cups of this kind, which enable a hinge to be readily fitted and removed, find use with different types of hinges, such as door hinges, window hinges, lid  
10 hinges and with hinges intended for other purposes.

The hinge cup is normally fitted to the hinged, element, e.g. the door or the window, while the frame part of the hinge is provided with its bearing element and the hinge blade.

15 However, in the case of some applications the hinge cup may be fitted to the fixed element and the hinge bearing carrying the hinge blade joined to the hinged element.

20 In order to enable one and the same hinge cup to be used both with right-hung and left-hung doors, windows and similar elements, the hinge cup is appropriately symmetrical about a vertical and/or a horizontal longitudinal centre plane passing through the hinge cup.

25 In the case of a hinge cup of the kind in question, particularly with respect to a door hinge, it is often required that the hinge cup is made of a fire-resistant material, so that the door will remain closed for as long as possible in the event of fire.

30 In the case of other types of hinge cups intended for simpler purposes, one or more of the cup components may consist of a plastic material, for instance an injection moulded plastic.

## DESCRIPTION OF THE BACKGROUND ART

Hinge cups that enable various settings to be made between respective hinge components are known to the art. For instance, PCT/NO99/00153 (TrioVing) describes a hinge that includes a hinge cup which primarily enables horizontal adjustments to be made between the hinge components. This hinge cup has a complicated construction and includes a large number of components. According to one embodiment, the hinge cup also enables vertical adjustments to be made. Such adjustments are complicated in practice, however, since they require manipulation of a top and a bottom setting screw.

US-A-5,339,493 (MacIntyre) describes another example of a complicated hinge cup that enables adjustments to be made in horizontal and vertical directions. This hinge cup has great thickness and a centrally provided horizontal screw member for lengthwise adjustments. It requires that a hole of great size for the cup is milled in the door.

Further examples of prior art devices are to be found in US,A,5,806,144 (Fries), US,A,5,788,351 (Prunty et al) and US,A,4,293,976 (Pittasch et al).

## OBJECTS OF THE PRESENT INVENTION

One object of the present invention is to provide a hinge cup of the aforesaid kind that has a simple construction and that is mass-produced and contains few components and with which vertical adjustments can be readily and reliably made to the hinge.

Another object is to provide a hinge cup having a small size and that will enable vertical or height adjustments to be made through the medium of one single adjusting member.

Another object is to provide a hinge cup which, when so required, consists of a number of force and torque absorbing components made of fire-resistant material, for instance steel plate, while one or more of the remaining cup components may

be made of a plastic material, therewith providing a hinge cup which is inexpensive in manufacture as a whole, without detracting from its fire-resistant requirements.

- 5 Still another object is to provide a hinge cup with which the fastener devices associated with the pivotal or hinged element or with the frame part can, at the same time, serve as connecting means between the hinge cup components.

### SUMMARY OF THE INVENTION

- 10 These and other objects are fulfilled with an inventive hinge cup that has the characteristic features set forth in the characterising clause of the accompanying Claim 1.

- 15 The snap-in fastening permits reliable and simply releasable securing of the hinge blade in the cup and, further, accurate engagement with the hinge blade is achieved together with beneficial torque relief that enables the outer dimensions of the hinge cup to be reduced. The height adjusting element may also include a relatively large surface that engages with one of the edge strips of the slide  
20 therewith also providing an effective contribution in this respect.

One single height adjustment member is required for reliable height adjustment between the hinge components, and may be manipulated readily from outside the hinge cup.

- 25 In practice, it is preferred that a vertical guide is provided on each side of the snap-in element, with each of said guides coacting with a corresponding guide of greater length in the rear wall of the hinge cup or with an element provided in said cup.

- 30 This two-fold guidance of slide movements provides additional torque relief and contributes to the symmetrical construction of the hinge cup.

In the case of the preferred embodiment, the height adjustment element is a nut-like element having six engagement surfaces and a sunken central part for manipulation by rotation of an hexagonal spanner of standard design.

- 5 Necessary openings in the rear and front walls of the hinge cup may have different shapes. For instance, the opening in the rear wall may have a rectangular shape, whereas the opening in the front wall may have the form of a round hole.

- 10 When the hinge is intended for simpler use, the hinge cup may have a plastic snap-in design.

- 15 According to one alternative embodiment, the hinge cup comprises a central surrounding frame part having top and bottom abutment surfaces for abutment with the slide edge strips, and front and back side walls which are let into the frame part while in abutment with the abutment surfaces.

- 20 When the frame part and the abutments consist of a plastic material and the slide and the side walls consist of metal, there is obtained a hinge cup that fulfils the highest requirements with regard to fire safety. Even should the plastic components melt in the heat of a fire, the metal parts of the hinge cup will be able to support the hinged door or similar element in its closed position for a longer period of time.

- 25 A further development of the inventive subject enables the hinge blade to be adjusted both vertically and horizontally.

- 30 Essential features of this latter embodiment are set forth in Claim 7. The two adjustment elements, which may be manipulated with the aid of one and the same hexagonal spanner, are disposed one beneath the other, i.e. their axes fall in a vertical symmetry plane through the hinge cup.

To enable horizontal adjustments to be made to the slide and the hinge blade, the hinge cup of this embodiment is wider than the slide, and also includes two upper and two lower screw fasteners which also function as means for connecting the

hinge cup components together. However, the outer measurements of the hinge cup will preferably be the same as those of the aforescribed hinge cup.

5 Further characteristic features of the invention will be apparent from the following description of two preferred embodiments of the invention, made with reference to the accompanying drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

10 Fig. 1 is a perspective of an inventive hinge that includes a frame-attachment part that includes a so-called curlicue and a pivotal hinge blade, and further includes a hinge cup that can be attached to a pivotal element, such as a door or a window, and into which the hinge blade can be snapped and removed therefrom.

15 Fig. 2 is a perspective view of a slide provided with a snap-in element and accommodated in the hinge cup.

Figs. 3-5 are partially cut-away front views of the hinge cup, wherein the different Figures show different height settings in respect of the slide and the hinge blade.

20

Fig. 6 is a cross-sectional view taken on the line VI-VI in Fig. 4.

Fig. 7 is a perspective view taken from the rear of the hinge cup shown in the earlier Figures, with slide and hinge blade in the position shown in Figure 4.

25

Fig. 8 is a front view of a further development of the invention with the front wall of the hinge cup removed, and shows horizontal adjustment of the slide.

30

Finally, Fig. 9 is a cross-sectional taken on the line IX-IX through the embodiment shown in Fig. 8.

## DESCRIPTION OF PREFERRED EMBODIMENTS

A hinge 1, for instance a door hinge, comprises a frame part 3 which includes a pivotal hinge blade 3a that includes an opening 3b.

5

The door part of the hinge comprises a hinge cup 2 that includes a parametrically extending frame element 2a that has openings 2b provided on mutually opposite sides for receiving the hinge blade 3a.

10

Because the hinge cup has two side openings, the same cup can be used for both right-hung and left-hung doors.

The side openings 2b have a greater vertical extension than the hinge blade 3a, so as to enable the hinge to be adjusted vertically.

15

As will be seen from Figs. 1 and 7, the hinge cup 2 includes a front wall 2c and a rear wall 2e each having a through-penetrating hole 2i for fastener screws 6 belonging to the hinge cup. These screws also function as means for connecting the cup components, in other words no separate connecting devices are required.

20

The front and the rear walls also include an upper central hole for a height adjustment device 5 described in more detail hereinafter.

25

The hinge-blade accommodating part of the hinge cup has the form of a slide 4 (see Fig. 2) which includes a top and a bottom edge strip 4a and 4b respectively. The slide also includes a snap-in device in the form of a stud 4c that can snap into the opening 3b in the hinge blade 3a. The snap-in device 4c is located on a slide-associated resilient part 4d that has been produced by removing material from the slide so as to form a cut-out 4e.

30

As will be apparent from Figs. 3-5, the slide 4 can move vertically between upper and lower abutments 2g, 2h in the interior of the hinge cup 2. The distance between the abutments is thus slightly greater than the vertical extension of the

slide. In its lower end position, the bottom edge strip 4b of the slide is in abutment with the bottom abutment 2h.

5 The slide 4 is provided on each side of the snap-in device 4c with a vertical strip 4e, said strips each being accommodated in a corresponding vertical opening 2j in the rear side wall 2e of the hinge cup (c.f. Fig. 7). The opening 2j is slightly longer than the strips 4e therewith forming torque-relieving vertical slide guides.

10 The upper edge strip 4a of the slide abuts with a centrally positioned height adjusting element 5a in said hinge cup, said element consisting of an eccentric nut-like element 5 having six planar surfaces 5b and mounted on a horizontal shaft in the upper abutment 2g of the hinge cup, of which surfaces 5b one surface engages the upper edge strip 4a of said slide in each height adjustment position.

15 The weight of the door rests on the upper edge strip 4a of the slide 4 via the actively operative surface 5b of the nut-like adjustment element 5, wherewith said vertical guides 4e assist in transferring occurring forces and torque to the hinge cup.

20 No additional height adjustment means are therefore necessary. The front wall 2c of the hinge cup includes a central round hole 2d through which a screwdriver for instance can be inserted and used to cause the snap-in element 4c to spring back when the hinge blade 3a shall be removed from the hinge cup. In order to make this possible, the rear wall 2e of the hinge cup has a rectangular opening 2f which  
25 enables the part 4d of the slide that carries the snap-in element 4c to spring back, as apparent from Fig. 7.

30 The frame part 2a and the top and bottom abutments 2g, 2h provided with holes for screw fasteners 6 may be comprised of injection moulded plastic, while the side walls 2c, 2e of the hinge cup consist of metal. The thickness of the abutments 2g, 2h will suitably be such as to enable the side walls to be accommodated within the surrounding frame 2a.

In the further embodiment illustrated in Fig. 8, the hinge cup 2 has a greater width than the slide 4 so as to enable horizontal or lateral adjustments to be made to the respective positions of the slide and the hinge blade. This embodiment includes opposite the height adjustment element 5 an element 7 which is non-rotatably mounted in the bottom abutment 2h and which includes an outwardly projecting peg 7a that is received in an opening in the adjacent edge strip 4b of the slide 4.

The length adjustment element 7 and the height adjustment element 5 can be rotated with the aid of a standard hexagonal spanner (not shown). In this case, the slide also includes top and bottom horizontal guide strips 4f for coaction with corresponding openings in a separate part 8 of the hinge cup, said part also including openings for the vertical guides 4e. This embodiment thus lacks in the rear wall 2e of the hinge cup openings that correspond to the openings 2j.

This further development of the invention may also include a separate fixing element (not shown) for the length adjustment element 7.

It will be understood that further embodiments of the invention are possible within the scope of the accompanying Claims.

## CLAIMS

1. A hinge cup for accommodation of a hinge blade comprising  
a) a side opening (2b) for receiving the hinge blade (3a) and having a greater  
5 vertical extension than said blade so as to enable the hinge (1) to be adjusted  
vertically;  
b) a hinge blade accommodating part (4) provided in the hinge cup (2), said  
accommodating part including a slide (4) which has top and bottom edge strips  
(4a) for coaction with the hinge blade (3a) and which can move between top and  
10 bottom abutments (2g, 2h) in the hinge cup (2) and includes a vertical guide (4e,  
4j) for height adjustment movement;  
c) an externally manipulatable height adjustment element (5) for the  
accommodation part, said element (5) engaging one of the edge strips (5a);  
d) one or more holes (2i) in the hinge cup (2) for receiving cup fastening members  
15 (6),  
**characterised in that**  
the slide (4) has a snap-in means for cooperation with a corresponding means such  
as a hole in the hinge blade (3a); and  
in that the height adjustment element comprises an eccentric element (5, 5a)  
20 which is mounted on a horizontal shaft in one of the abutments (2g, 2h) in said  
hinge cup, said eccentric element having two or more planar surfaces (5b) which  
engage with an adjacent edge strip (4a) on said slide.
2. A hinge cup according to Claim 1, **characterised in that** a vertical guide  
25 (4e) is provided on each side of the snap-in element (4c), wherein each of said  
guides (4e) coacts with a corresponding guide (2j) of greater length in the rear  
wall (2e) of the hinge cup or with an element (8) accommodated in said hinge cup.
3. A hinge cup according to Claim 1 or Claim 2, wherein the height adjustment  
30 element (5, 5a) is a nut-like element that has six engagement surfaces (5b) and a  
sunken central part (5c) for manipulation with the aid of a hexagonal spanner.
4. A hinge cup according to any one of Claims 1-3, wherein the hinge cup  
comprises a central parametrical frame part (2a) having top and bottom abutments

(2g, 2h) for abutment with the edge strips (4a, 4b) of the slide (4) and front and rear side walls (2c, 2e) that are let into the frame part (2a) while said edge strips are in engagement with said abutments.

5        5.    A hinge cup according to Claim 4, wherein the frame part (2a) and the abutments (2g, 2h) consist of a plastic material, and in that the slide (4) and the side walls (2c, 2e) consist of metal.

10       6.    A hinge cup according to any one of Claims 1-5, wherein the screw fasteners (6) extending through holes (2i) in the front and rear side walls (2c, 2e) and the abutments (2g, 2h) also function to hold the cup components together.

15       7.    A hinge cup according to any one of the preceding Claims, wherein the hinge cup (2) has a greater width than the slide (4); and in that the slide is adjustable horizontally by means of an element (7) which is non-rotatably mounted in an associated abutment (2h) opposite the height adjustment element (5) and which has an outwardly projecting peg (6) that is received in an opening in the adjacent edge strip (4b) of said slide.

Fig. 1

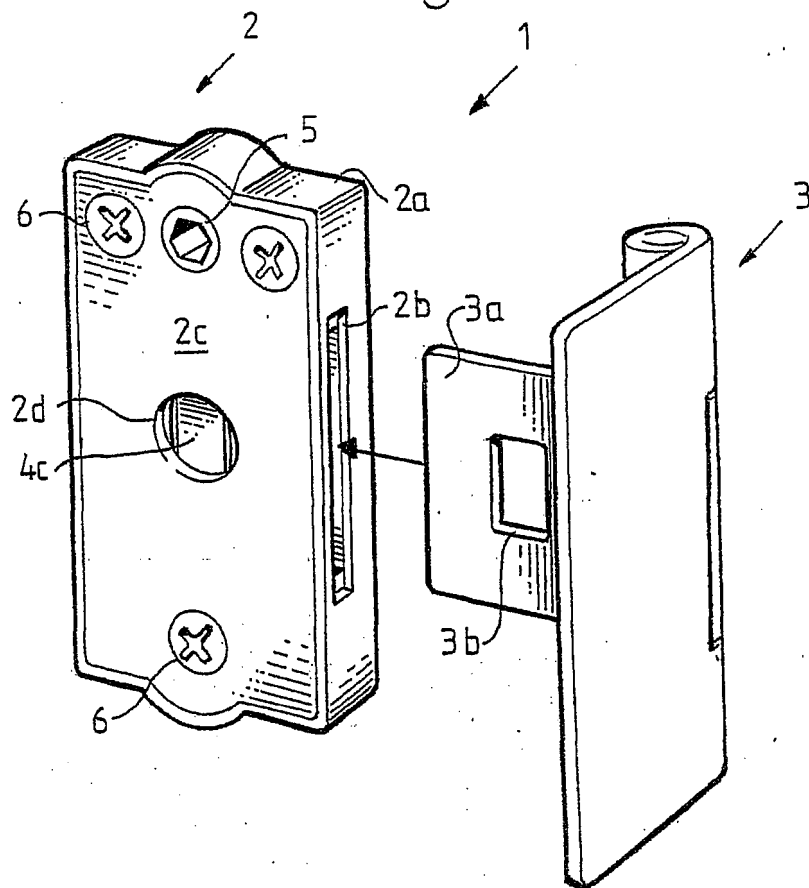


Fig. 2

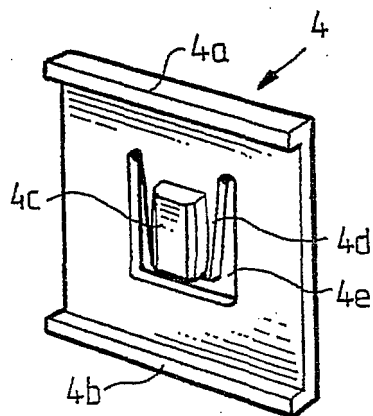


Fig. 3

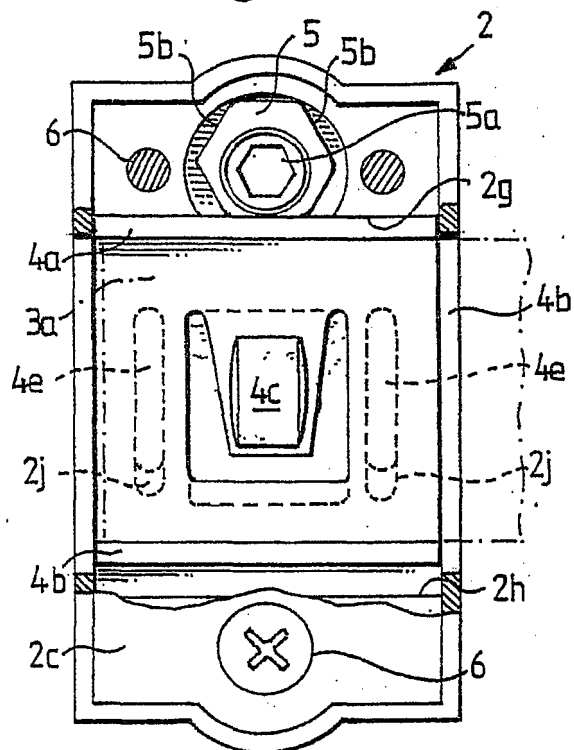


Fig. 4

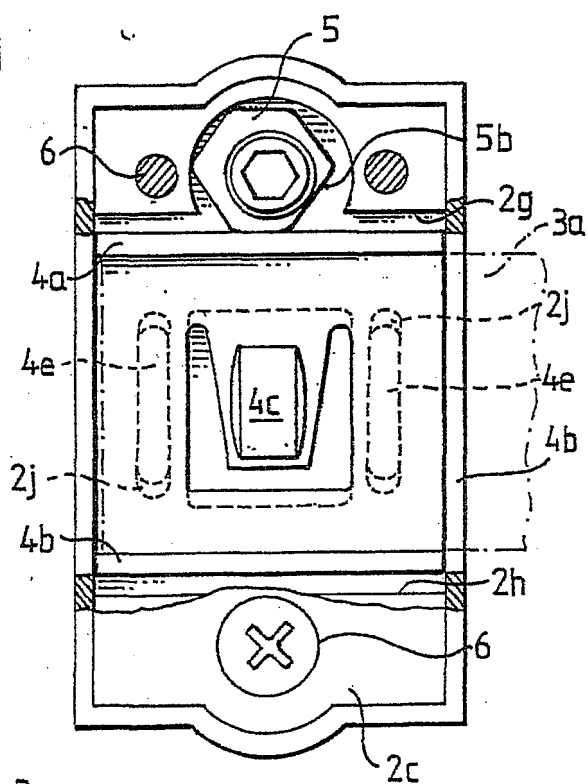


Fig. 5

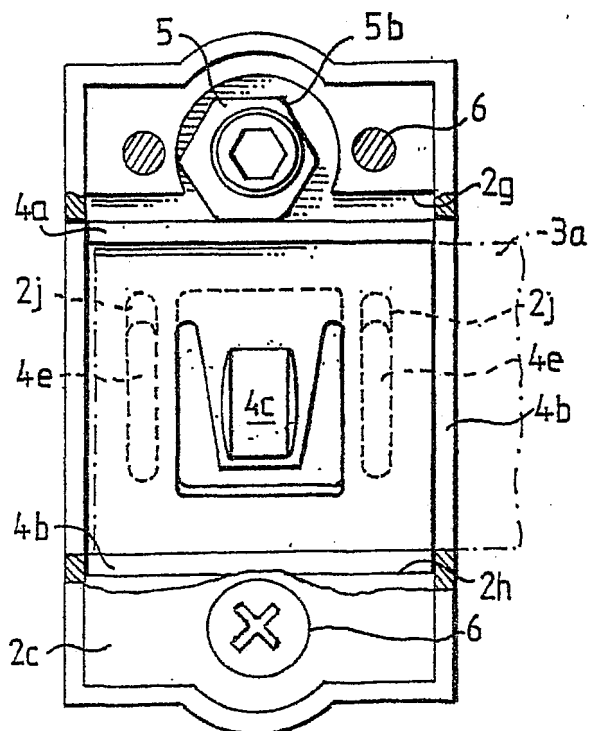


Fig.6

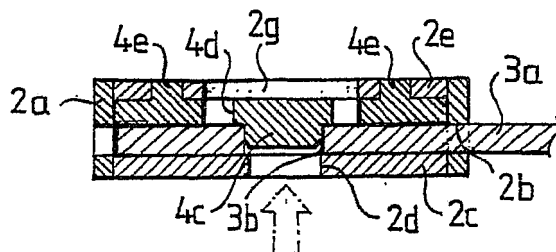


Fig.7

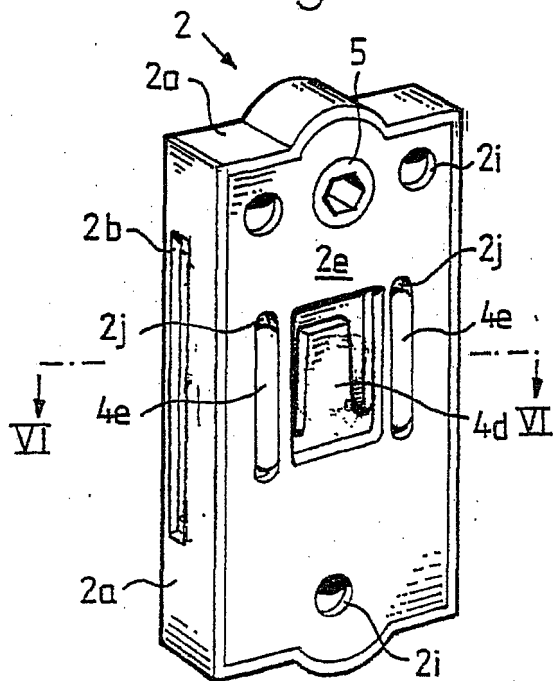


Fig.8

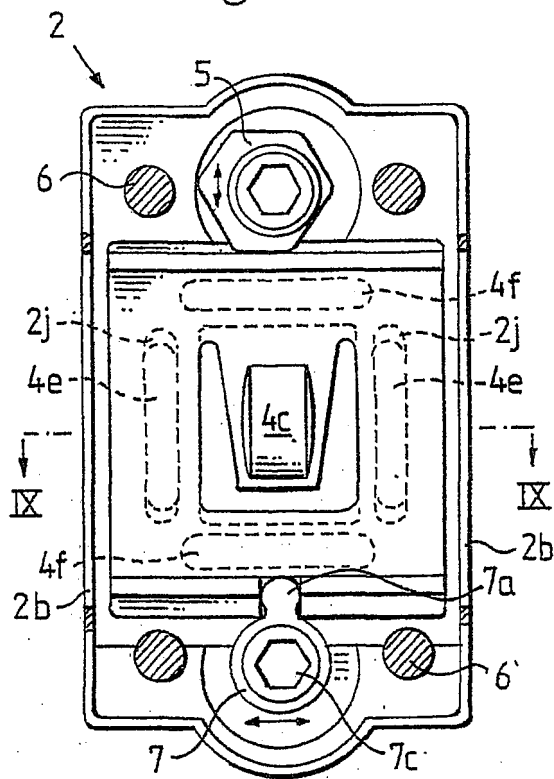
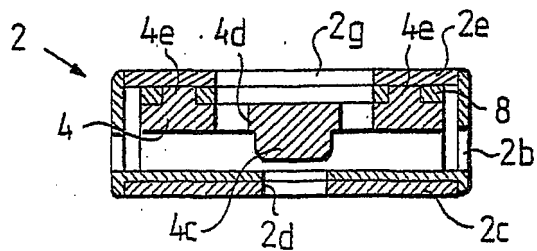


Fig.9



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 01/00920

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G05D 2/04, E05D 2/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: E05D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5339493 A (ROBERT J. MACINTYRE), 23 August 1994 (23.08.94) --	
A	US 5806144 A (BROR FRIES), 15 Sept 1998 (15.09.98) --	
A	US 5788351 A (JEFFREY L. PRUNTY ET AL), 4 August 1998 (04.08.98) --	
A	US 4293976 A (WILLI PITTASCH ET AL), 13 October 1981 (13.10.81) -- -----	

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

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"&amp;" document member of the same patent family

Date of the actual completion of the international search

14 August 2000

Date of mailing of the international search report

21-08-2001

Name and mailing address of the ISA/

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

02/07/01

International application No.

PCT/SE 01/00920

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
US	5339493	A	23/08/94	NONE	
US	5806144	A	15/09/98	AU 5140098 A NO 304158 B NO 964956 A WO 9822680 A	10/06/98 02/11/98 22/05/98 28/05/98
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